

005724-05300

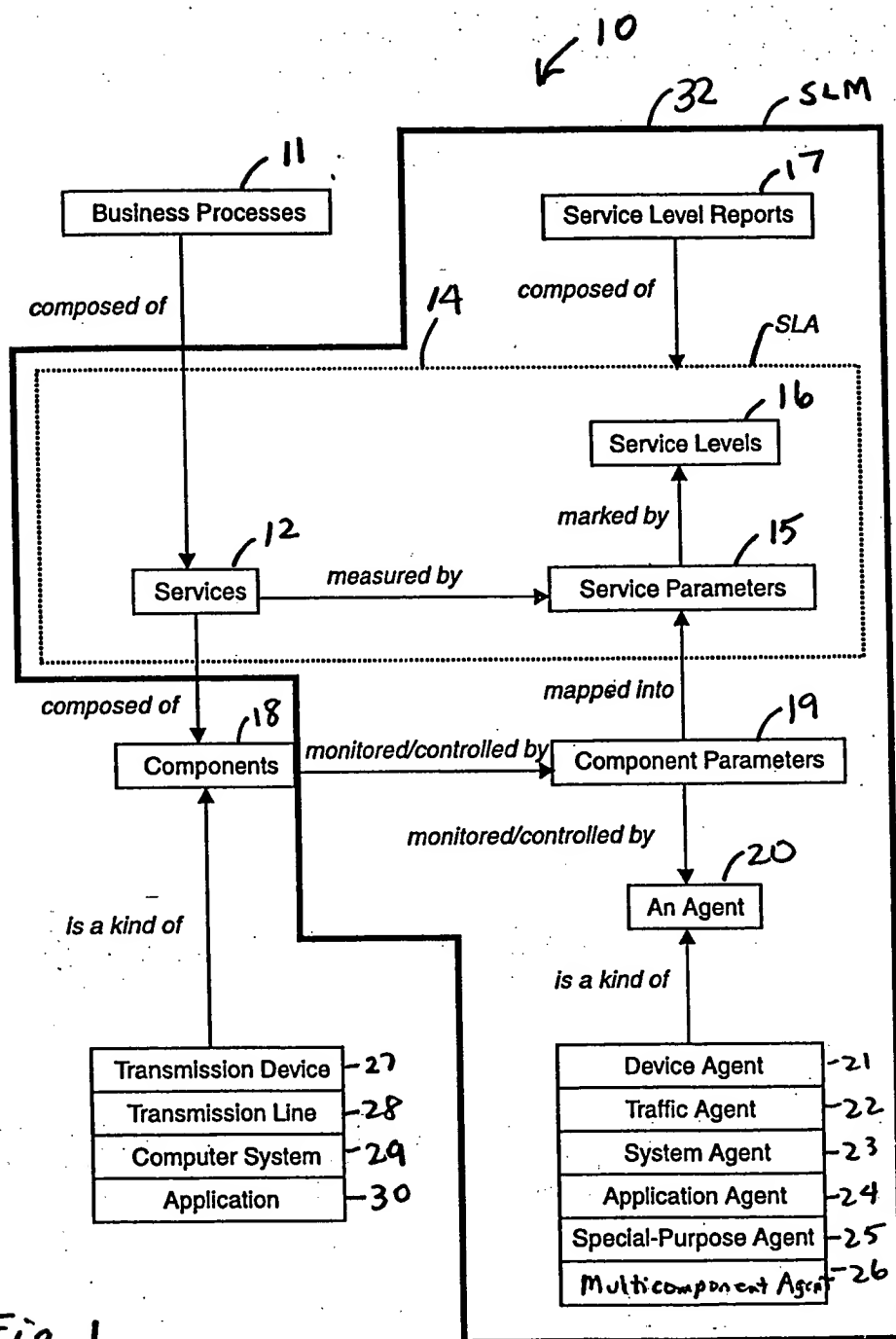


Fig. 1

1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	2101	2102	2103	2104	2105	2106	2107	2108	2109	2110	2111	2112	2113	2114	2115	2116	2117	2118	2119	2120	2121	2122	2123	2124	2125	2126	2127	2128	2129	2130	2131	2132	2133	2134	2135	2136	2137	2138	2139	2140	2141	2142	2143	2144	2145	2146	2147	2148	2149	2150	2151	2152	2153	2154	2155	2156	2157	2158	2159	2160	2161	2162	2163	2164	2165	2166	2167	2168	2169	2170	2171	2172	2173	2174	2175	2176	2177	2178	2179	2180	2181	2182	2183	2184	2185	2186	2187	2188	2189	2190	2191	2192	2193	2194	2195	2196	2197	2198	2199	2200	2201	2202	2203	2204	2205	2206	2207	2208	2209	2210	2211	2212	2213	2214	2215	2216	2217	2218	2219	2220	2221	2222	2223	2224	2225	2226	2227	2228	2229	2230	2231	2232	2233	2234	2235	2236	2237	2238	2239	2240	2241	2242	2243	2244	2245	2246	2247	2248	2249	2250	2251	2252	2253	2254	2255	2256	2257	2258	2259	2260	2261	2262	2263	2264	2265	2266	2267	2268	2269	2270	2271	2272	2273	2274	2275	2276	2277	2278	2279	2280	2281	2282	2283	2284	2285	2286	2287	2288	2289	2290	2291	2292	2293	2294	2295	2296	2297	2298	2299	2300	2301	2302	2303	2304	2305	2306	2307	2308	2309	2310	2311	2312	2313	2314	2315	2316	2317	2318	2319	2320	2321	2322	2323	2324	2325	2326	2327	2328	2329	2330	2331	2332	2333	2334	2335	2336	2337	2338	2339	2340	2341	2342	2343	2344	2345	2346	2347	2348	2349	2350	2351	2352	2353	2354	2355	2356	2357	2358	2359	2360	2361	2362	2363	2364	2365	2366	2367	2368	2369	2370	2371	2372	2373	2374	2375	2376	2377	2378	2379	2380	2381	2382	2383	2384	2385	2386	2387	2388	2389	2390	2391	2392	2393	2394	2395	2396	2397	2398	2399	2400	2401	2402	2403	2404	2405	2406	2407	2408	2409	2410	2411	2412	2413	2414	2415	2416	2417	2418	2419	2420	2421	2422	2423	2424	2425	2426	2427	2428	2429	2430	2431	2432	2433	2434	2435	2436	2437	2438	2439	2440	2441	2442	2443	2444
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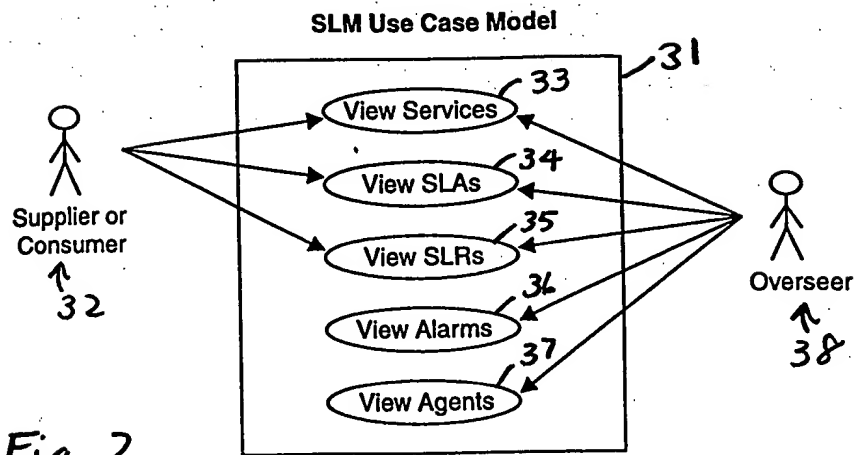


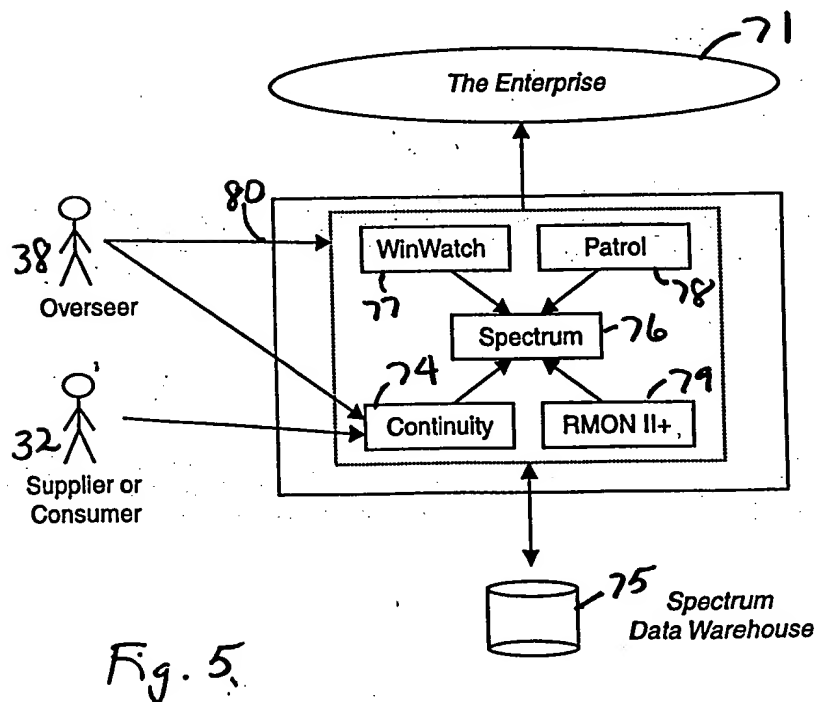
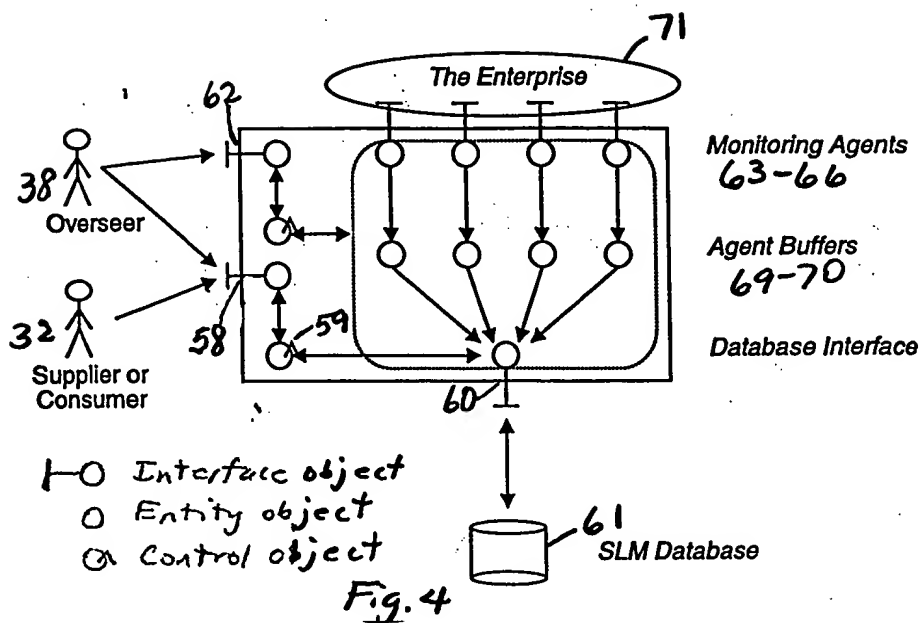
Fig. 2

```
graph TD
    EC[Event Correlation 55] -- "results in" --> AO[Alarm Object 46]
    AO -- "handled by" --> AN[Alarm Notifier 54]
    AN -- "communicates with" --> NM[Notifier Medium 53]
    NM -- "is a kind of" --> AGUI[Alarm GUI 47]
    NM -- "is a kind of" --> P[Pager 48]
    NM -- "is a kind of" --> ET[Trouble Ticket 49]
    NM -- "is a kind of" --> EMail[E-mail 50]
    NM -- "is a kind of" --> PPhone[Phone 51]
    DA[Device Alarm 40] -- "is a kind of" --> AO
    LA[Line Alarm 41] -- "is a kind of" --> AO
    SA[System Alarm 42] -- "is a kind of" --> AO
    AA[Application Alarm 43] -- "is a kind of" --> AO
    UA[User Alarm 44] -- "is a kind of" --> AO
    SA2[Service Alarm 45] -- "is a kind of" --> AO
```

The diagram illustrates the architecture of an alarm system. At the bottom, a box labeled "Event Correlation" (55) has an upward arrow labeled "results in" pointing to a box labeled "Alarm Object" (46). From "Alarm Object" (46), an upward arrow labeled "handled by" points to a box labeled "Alarm Notifier" (54). From "Alarm Notifier" (54), an upward arrow labeled "communicates with" points to a box labeled "Notifier Medium" (53). From "Notifier Medium" (53), five arrows labeled "is a kind of" point to a table structure at the top. The table has two columns and three rows. The first row contains "Alarm GUI" (47) and "Siren" (50). The second row contains "Pager" (48) and "E-mail" (51). The third row contains "Trouble Ticket" (49) and "Phone" (52). On the left side of the diagram, a vertical stack of five boxes represents different alarm types: "Device Alarm" (40), "Line Alarm" (41), "System Alarm" (42), "Application Alarm" (43), "User Alarm" (44), and "Service Alarm" (45). Arrows labeled "is a kind of" point from each of these boxes to the "Alarm Object" (46) box.

Fig. 3

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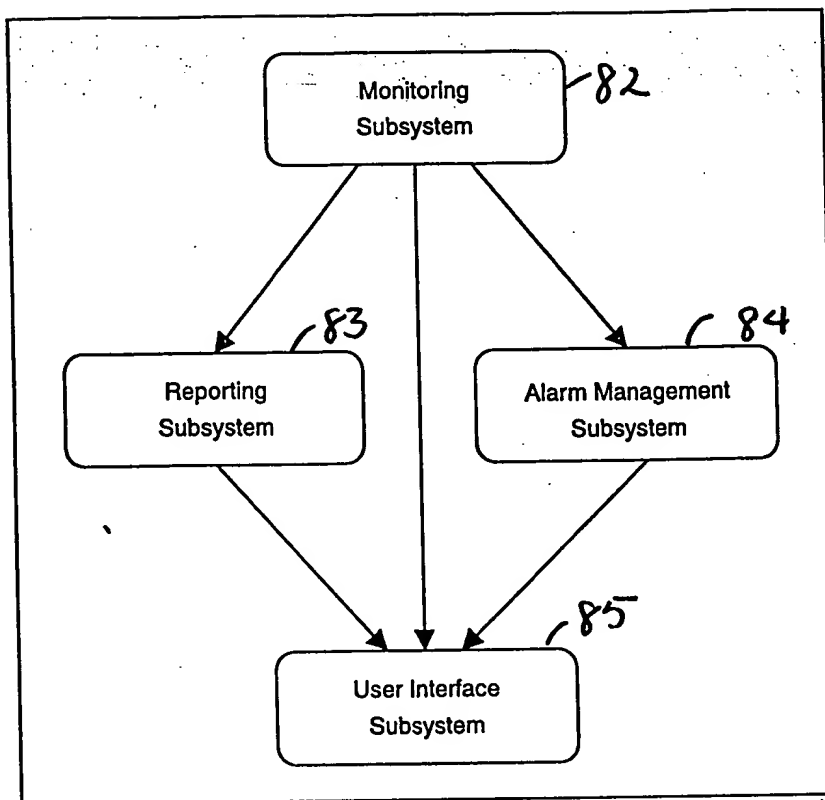
[illegible]

Fig. 6

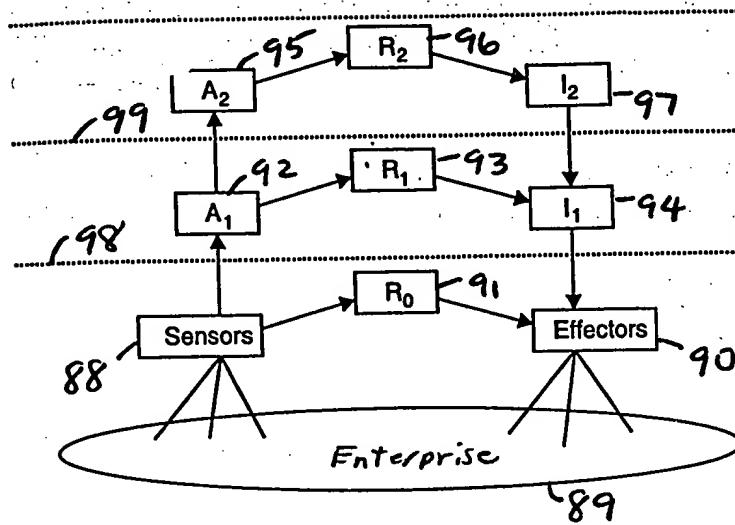


Fig. 7

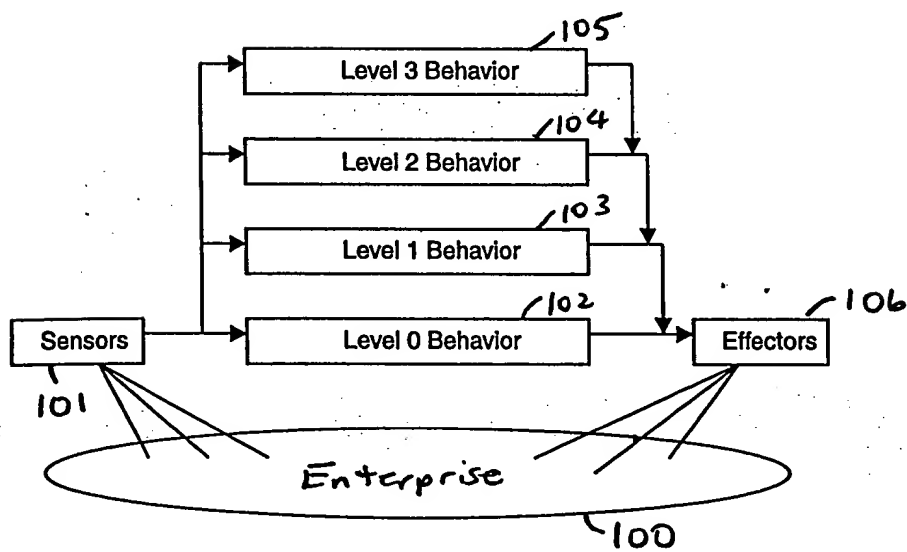


Fig. 8

000000 422/560

Level 2 Abstraction,  
Reasoning, Instruction

Level 1 Abstraction,  
Reasoning, Instruction

Level 0 Abstraction,  
Reasoning,  
Instruction

Monitoring

Auto  
Control

Human  
Control

Fig. 9

The Enterprise 114

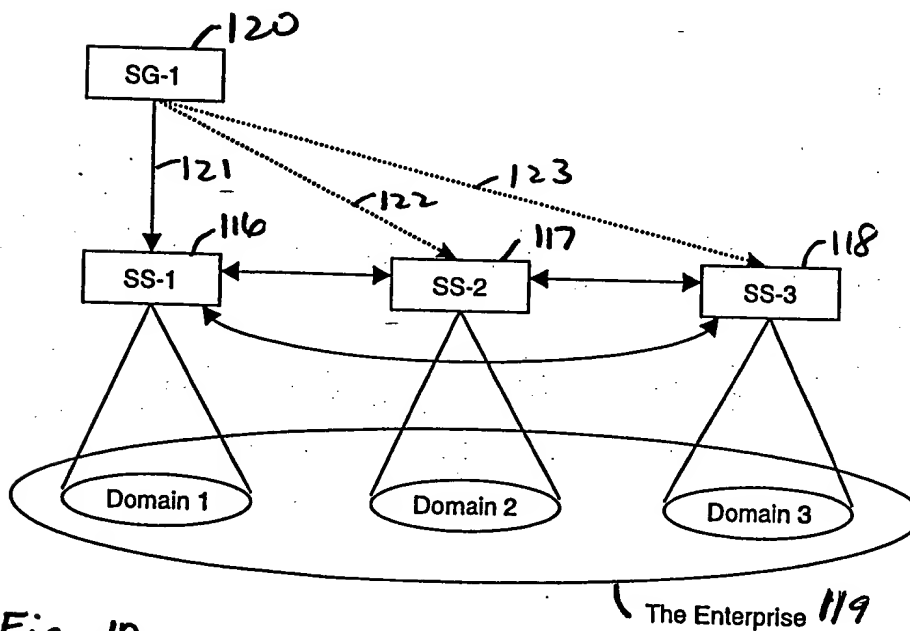
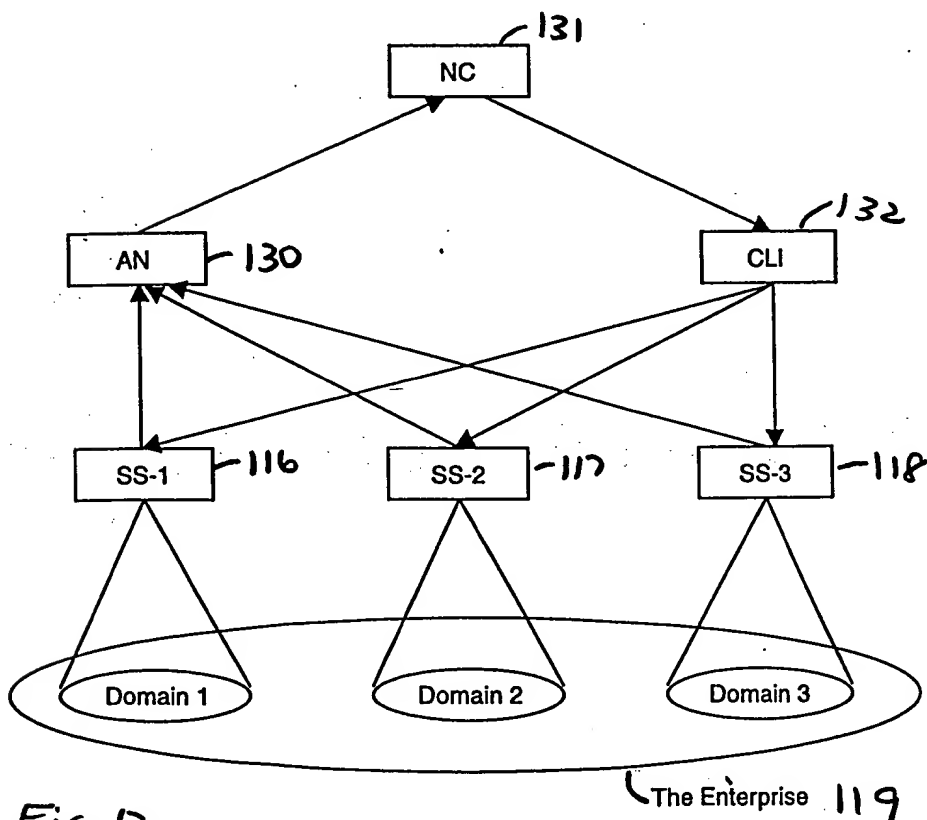
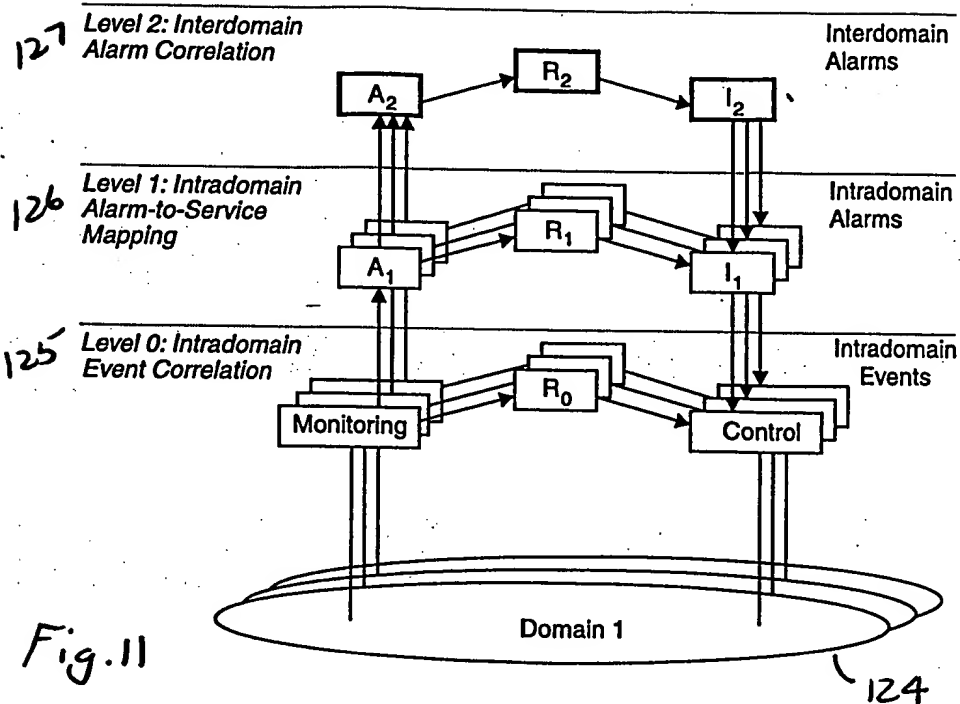


Fig. 10

The Enterprise 119

0057724-052300





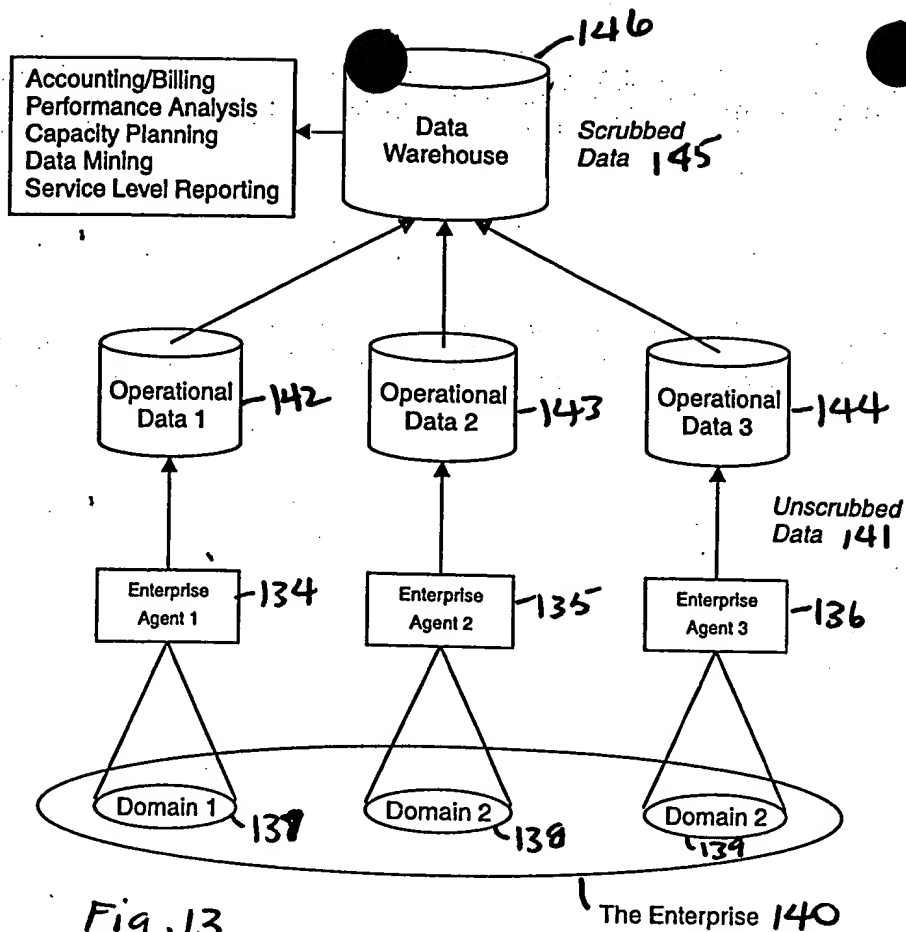


Fig. 13

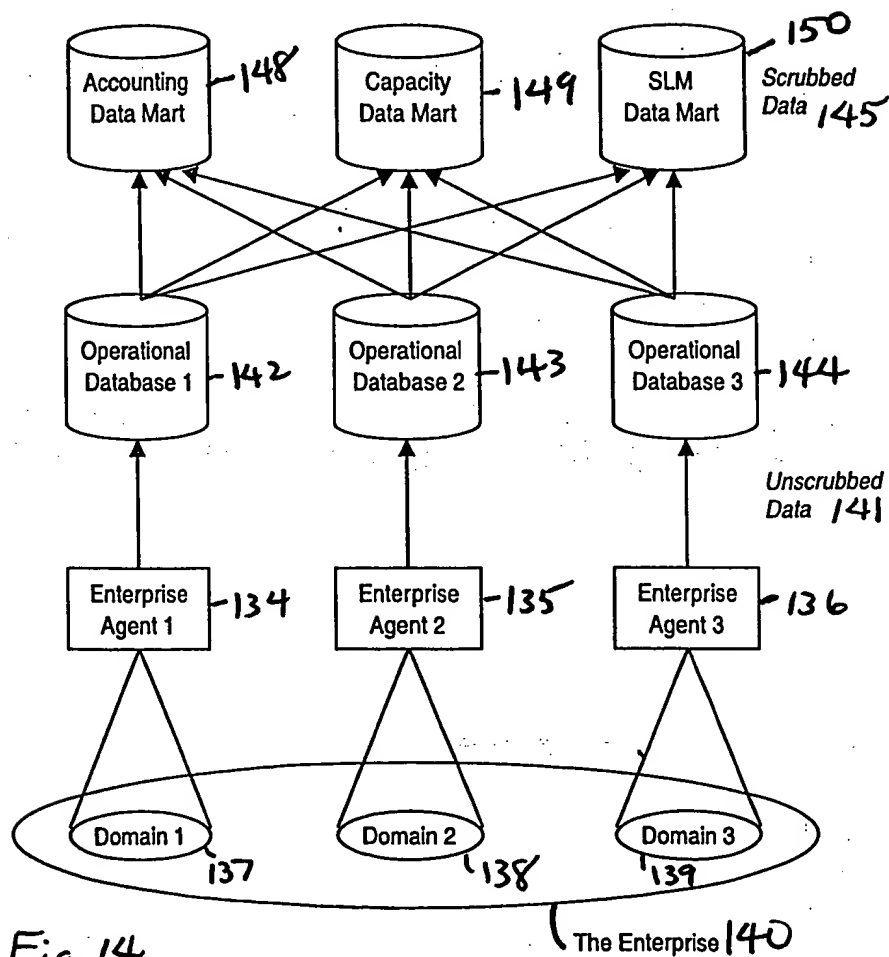


Fig. 14

```

graph TD
    subgraph Enterprise [The Enterprise 140]
        subgraph Domains
            D1((Domain 1 137))
            D2((Domain 2 138))
            D3((Domain 3 139))
        end
        EA1[Enterprise Agent 1 134]
        EA2[Enterprise Agent 2 135]
        EA3[Enterprise Agent 3 136]
        D1 --- EA1
        D2 --- EA2
        D3 --- EA3
    end

    EA1 --> OD1[(Operational Database 1 142)]
    EA2 --> OD2[(Operational Database 2 143)]
    EA3 --> OD3[(Operational Database 3 144)]

    OD1 --> DW[(Data Warehouse 147)]
    OD2 --> DW
    OD3 --> DW

    DW --> ADM[(Accounting Data Mart 148)]
    DW --> CDM[(Capacity Data Mart 149)]
    DW --> SLM[(SLM Data Mart 150)]

    subgraph Data_Marts
        ADM
        CDM
        SLM
    end

    SLM --- SD[Scrubbed Data 145]
    DW --- SD

```

Fig. 15

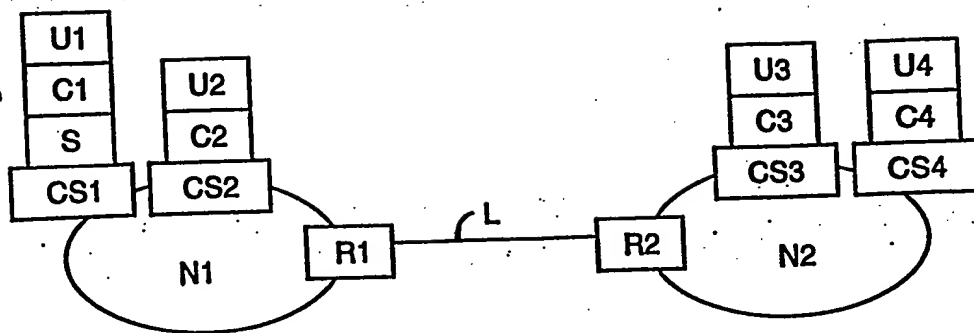


Figure 5.1, Fig. 16

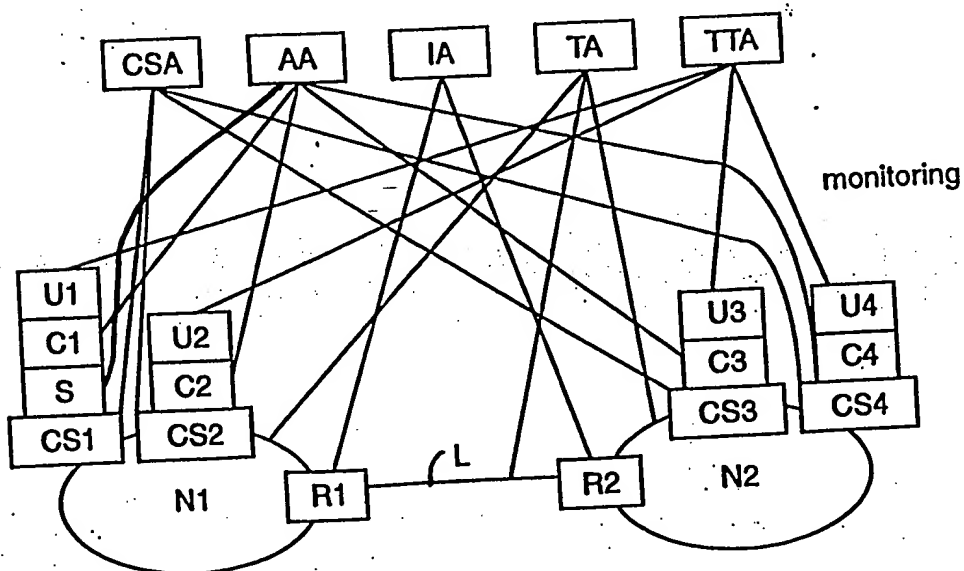


Figure 5.2 Fig. 17

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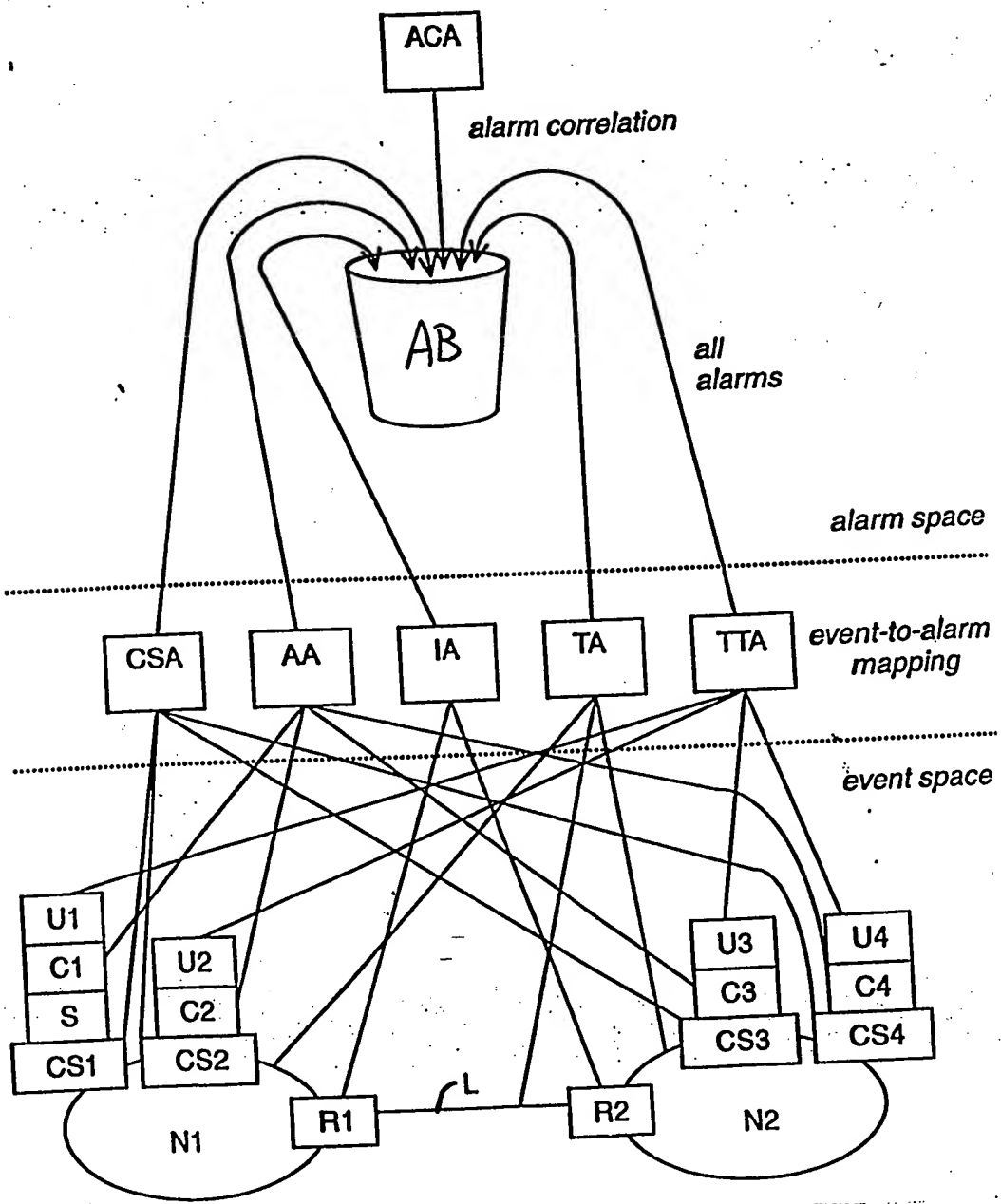


Figure 5.5

Fig. 18

Fig. 19

Detect events in  $\sim 160$   
the network

↓  
For each aspect of network  $\sim 161$   
operation, map event(s) to  
alarm(s)

↓  
Output alarms to  $\sim 162$   
alarm bucket

↓  
Correlate/Evaluate alarms to  $\sim 163$   
determine network operation  
status

↓  
Report Network operation  $\sim 164$   
status

↓  
Identify corrective actions  $\sim 165$   
necessary for desired operation of  
network

↓  
Implement corrective  $\sim 166$   
actions or report identified  
corrective actions

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Fig. 20

Detect events for ~167  
a specific aspect of network  
operation



Map detected events ~168  
to an alarm or alarms



Output alarm or ~169  
alarms

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The diagram illustrates the architecture of an expert system. It features a vertical dashed line separating "the world" (left) from "the agent" (right). The world is labeled with the number 175, and the agent is labeled with the number 170. Within the agent's domain, three components are shown: "Working Memory" (labeled 172), "Reasoning Algorithm" (labeled 174), and "Rule Base" (labeled 173). An arrow points from the world into the Working Memory. Bidirectional arrows connect Working Memory and the Reasoning Algorithm. A curved arrow points from the Reasoning Algorithm back into the world. A straight arrow points from the Rule Base to the Reasoning Algorithm.

```
graph TD; A[New Problem] --> B[Retrieve]; B --> C[Adapt]; C --> D[Execute]; D --> E[Embed]; E --> B; E --> F[Case Library]; F --> B;
```

The flowchart illustrates the Case-Based Reasoning (CBR) cycle. It begins with a 'New Problem' (labeled 176) which leads to the 'Retrieve' step (labeled 178). From 'Retrieve', the process moves to 'Adapt' (labeled 179), then to 'Execute' (labeled 180). The 'Execute' step leads to 'Embed' (labeled 181), which then feeds back into 'Retrieve'. Additionally, the 'Embed' step leads to the 'Case Library' (labeled 177), which also feeds back into 'Retrieve'.

Fig. 22

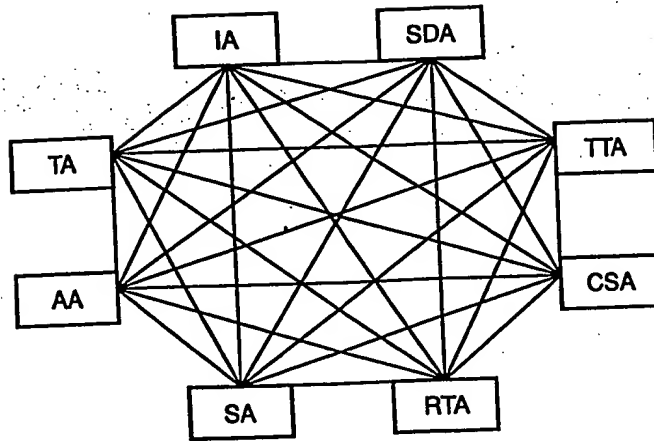


Fig. 23

190

Friday January 5 2001 -191			
	Service 1	Service 2	Service 3
<b>Seattle</b>			
Bldg 1	Up	Up	Down, up at 12 PM
Bldg 2	Down 8-10 PM	Down 8-10 PM	Down 8-10PM
Bldg 3	Up (Slow)	Up	Up
<b>Sydney</b>			
Bldg 1	Up	Up	Down, up ?
Bldg 2	Up	Up (slow)	Up
.			
.			
.			

Fig. 24

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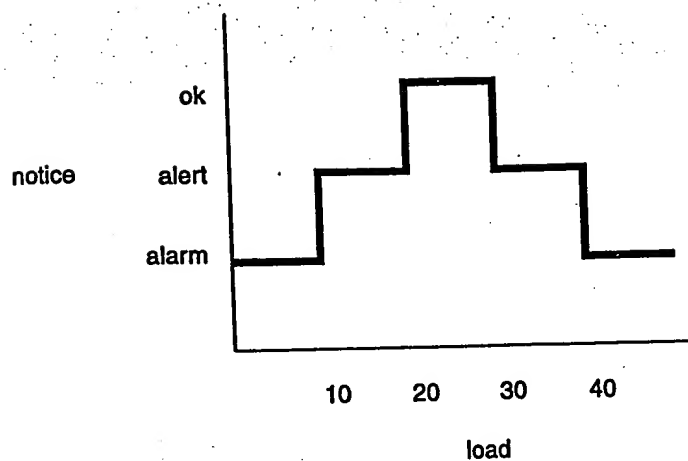


Fig. 25

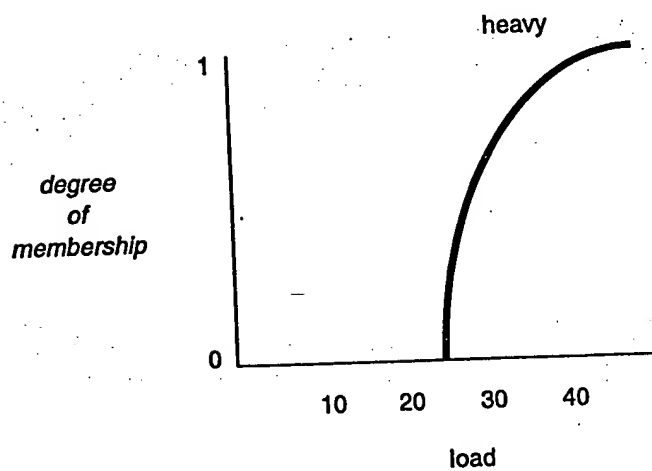


Fig. 26

```
graph TD; 200[Define Grammar] --> 201[Define Membership Functions]; 201 --> 200; 201 --> 202[Define Fuzzy Rules]; 202 --> 201; 202 --> 203[Define Fuzzy Inference Strategy]; 203 --> 202; 203 --> 204[Define Defuzzification Methods]; 204 --> 203; 204 --> production[production];
```

The flowchart illustrates the sequential steps of a fuzzy logic process, with each step in a rectangular box and bidirectional arrows indicating interaction between adjacent steps. The steps are labeled with handwritten numbers to the right of each box:

- 200**: Define Grammar
- 201**: Define Membership Functions
- 202**: Define Fuzzy Rules
- 203**: Define Fuzzy Inference Strategy
- 204**: Define Defuzzification Methods

A curved arrow points from the bottom of box 204 to the word **production** at the bottom right of the diagram.

Fig. 27

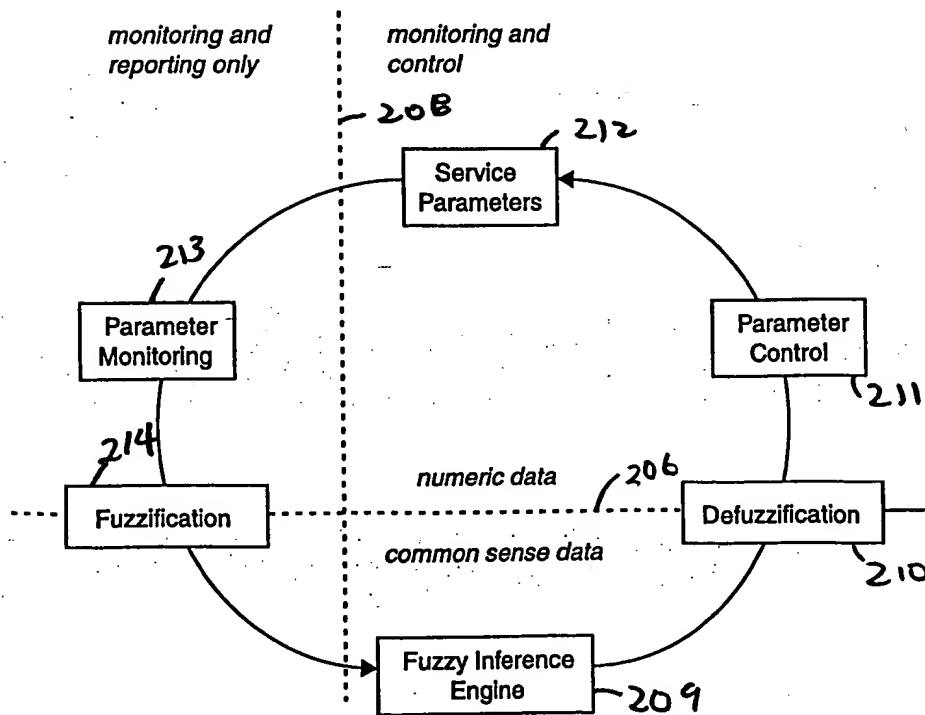


Fig. 28

095724-05200

possible influences on SP <sup>225</sup>

<sup>224</sup> target

	P1	P2	P3	P4	P5	...	PN	SP
t1	---	---	---	---	---	---	---	---
t2	---	---	---	---	---	---	---	---
t3	---	---	---	---	---	---	---	---
t4	---	---	---	---	---	---	---	---
t5	---	---	---	---	---	---	---	---
t6	---	---	---	---	---	---	---	---
.								
.								
.								

<sup>222</sup>

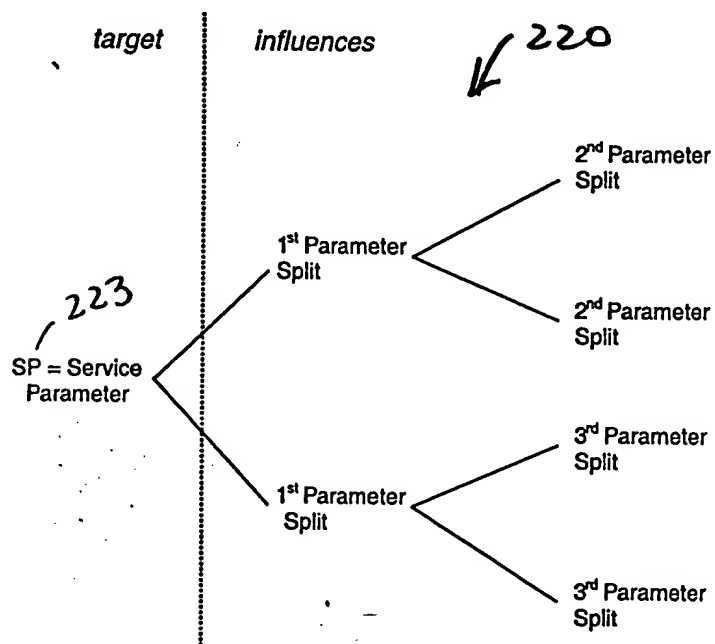


Fig. 29

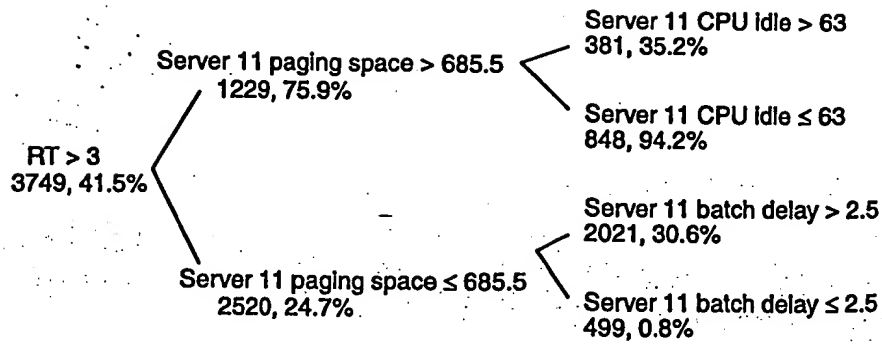


Fig. 30

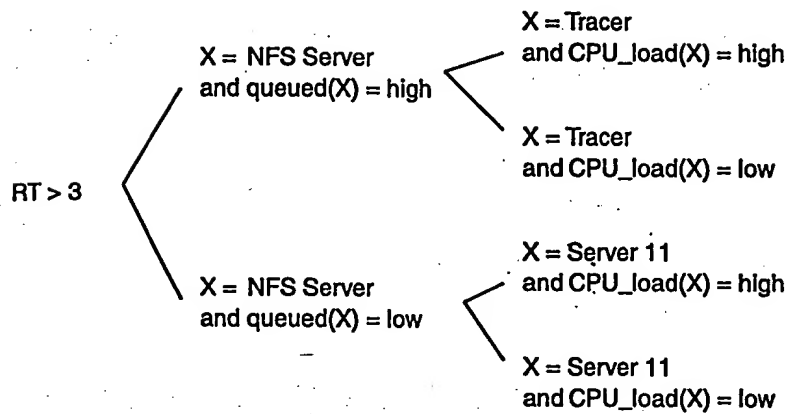


Fig. 31

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230

Service Agreement with XYZ Server Farm						
Name						
Address						
Phone						
Email						
Policies						
Availability		___ (select 90 – 100 %)			\$___	
Response Time		___ (select 2 – 5 sec)			\$___	
Security		___ (select high- med-low)			\$___	
Integrity		___ (select high- med-low)			\$___	
					Total: \$___	
Go Back		(Month)			Go Forward	
Default: Availability ___ Response time ___ Security ___ Integrity___						
Send Cancel						

Fig. 32

Figure 1: High level architecture of the EC Enterprise. The diagram illustrates the flow of data and management functions within the EC Enterprise (250). At the base, four management modules (251-254) handle security, network devices, NT/Unix servers, and software inventory. These modules feed into a central processing block (256) which manages SLAs and handles event reporting and correlation. A web interface (258) also interacts with this central block. The central block sends selected events to a data warehouse (262), which then provides data for service reports (264), specialized reporting (265), and data mining (266). A dashed line separates the off-line, out-of-band management (top) from the real-time, in-band management (bottom). The bottom section includes multidomain alarm correlation (259), fault notification (260), and automated fault repair (261), which receive faults from the central processing block.

Fig. 33

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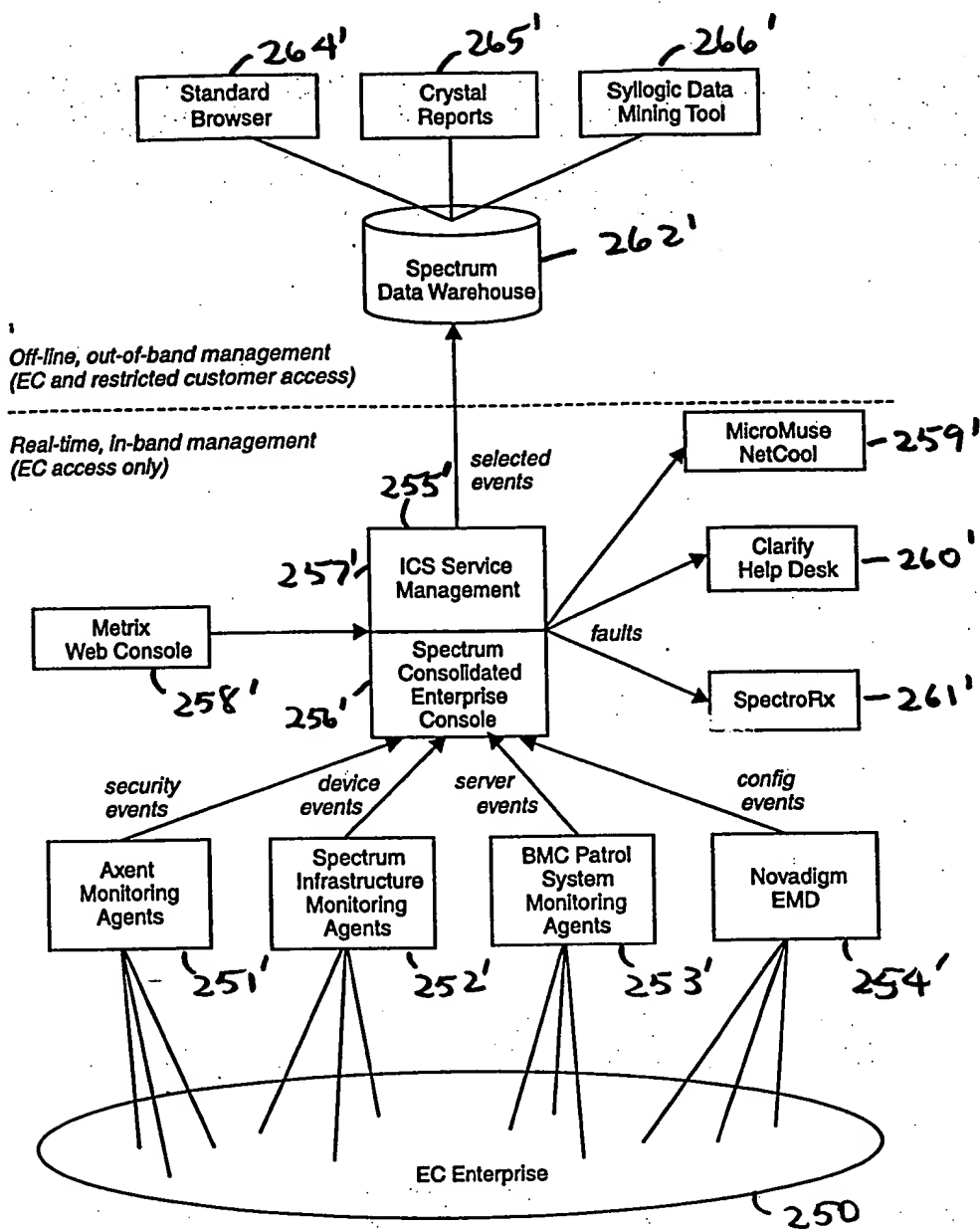


Fig. 34

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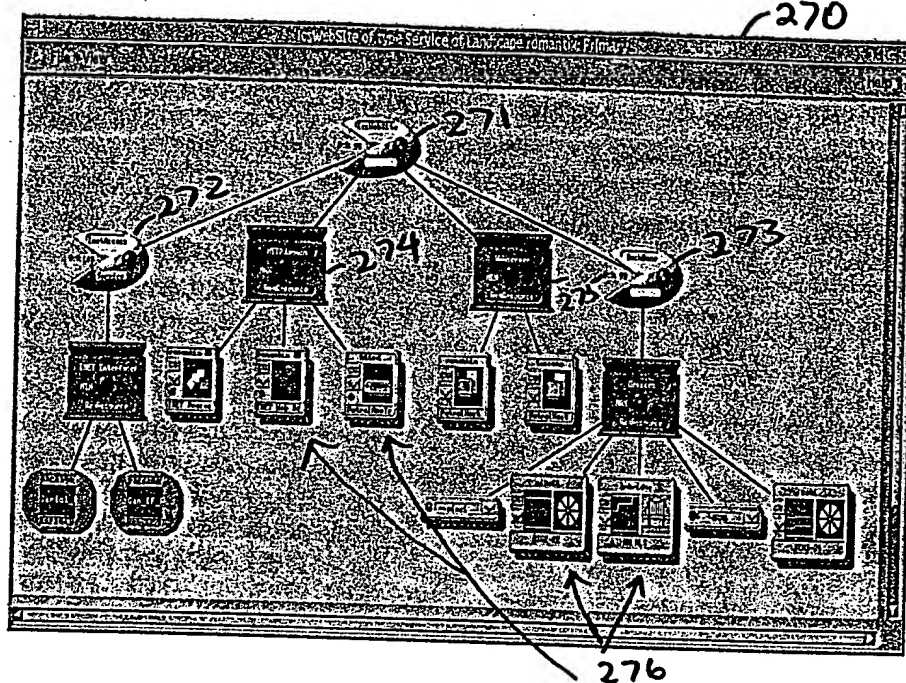


Fig. 35

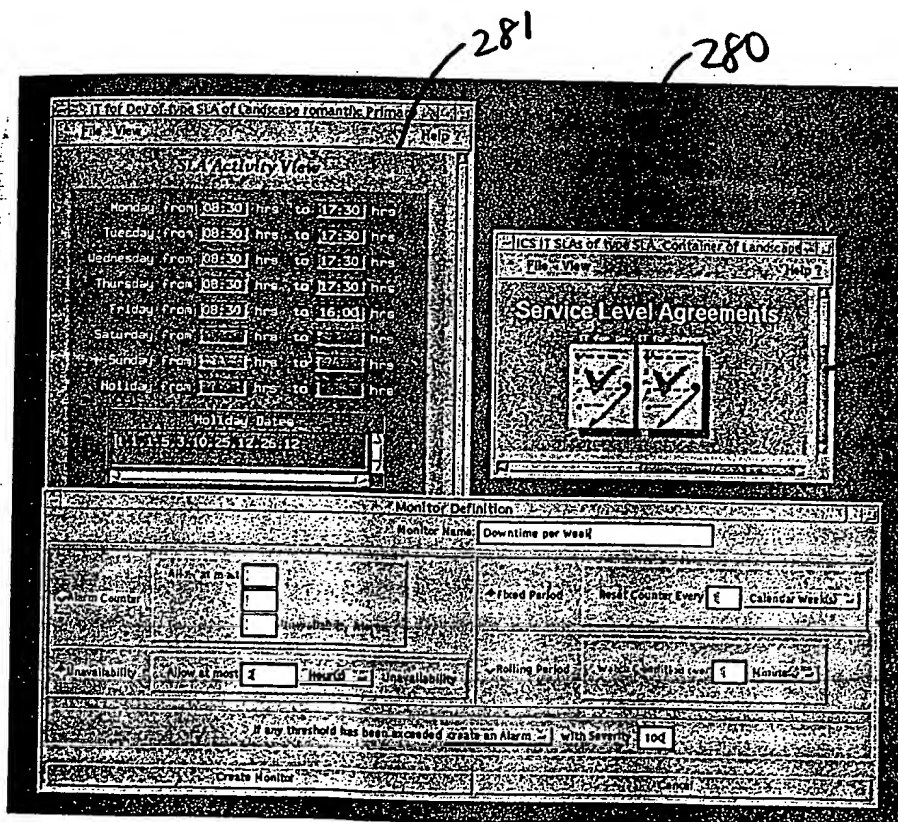


Fig. 36



0057224-05200

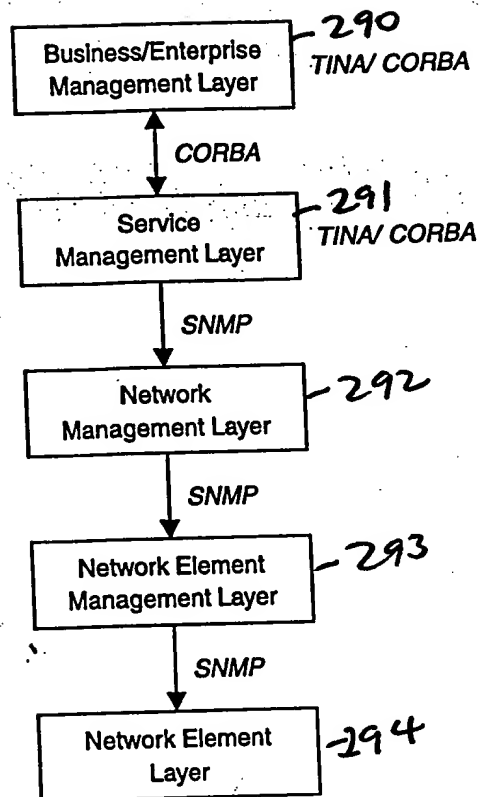


Fig. 37

```
graph BT; NM[Network Management] --> EM[Enterprise Management]; SM[Systems Management] --> EM; AM[Application Management] --> EM; TM[Traffic Management] --> EM; EM --> SLM[Service Level Management]; SLM --> BPM[Business Process Management]
```

Fig. 38